WHAT IS CLAIMED IS:

1.   A moving image decoding method of decoding encoded moving image data, which is generated by decomposing each frame of moving image data into a
5   plurality of subbands, and encoding coefficients of the subbands from upper to lower bits for respective bitplanes or sub-bitplanes for each predetermined unit, comprising:

       a decoding process time information acquisition
10   step of acquiring information used to examine a difference between a time assigned to a decoding process of encoded moving image data for the predetermined unit, and a time required for an actual decoding process;

15   a non-decoding bitplane determination step of determining bitplanes or sub-bitplanes which are not to be decoded on the basis of the information acquired in the decoding process time information acquisition step;

       a bitplane decoding step of reclaiming the
20   coefficients of the subbands from encoded data of bitplanes or sub-bitplanes other than the bitplanes or sub-bitplanes determined in the non-decoding bitplane determination step; and

       a subband composition step of generating frame
25   data by compositing the coefficients of the plurality of subbands obtained in the bitplane decoding step.

2.   The method according to claim 1, wherein the decoding process time information acquisition step includes a step of acquiring a decoding process time required for the decoding process of the encoded moving

5   image data, and the non-decoding bitplane determination step includes a step of determining the bitplanes or sub-bitplanes which are not to be decoded on the basis of the decoding process time acquired in the decoding process time information acquisition step.

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3.   The method according to claim 1, further comprising:

        a decoded frame data storage step of storing the decoded frame data, and

15   in that the decoding process time information acquisition step includes a step of acquiring the number of frames stored in the decoded frame data storage step, and the non-decoding bitplane determination step includes a step of determining the

20   bitplanes or sub-bitplanes which are not to be decoded on the basis of the number of frames acquired in the decoding process time information acquisition step.

4.   The method according to claim 1, wherein the

25   non-decoding bitplane determination step includes a step of managing a parameter indicating image quality, adjusting the parameter on the basis of the information

acquired in the decoding process time information

acquisition step, and determining the bitplanes or

sub-bitplanes which are not to be decoded of each

subband on the basis of the parameter.

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5.   The method according to claim 1, wherein the

non-decoding bitplane determination step includes a

step of managing a table that stores the number of

bitplanes or sub-bitplanes which are not to be decoded

10   of each subband, and increasing/decreasing the number

of bitplanes or sub-bitplanes, which are not to be

decoded, stored in the table in accordance with the

information acquired in the decoding process time

information acquisition step.

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6.   The method according to claim 2, wherein the

non-decoding bitplane determination step includes a

step of calculating a difference between a time

assigned to a decoding process of the encoded moving

20   image data of the predetermined unit, and the decoding

process time acquired in the decoding process time

information acquisition step, and determining the

bitplanes or sub-bitplanes which are not to be decoded

of each subband on the basis of an accumulated value of

25   the calculated differences.

7.   The method according to claim 1, wherein subband decomposition for generating the encoded moving image data is attained by two-dimensional discrete wavelet transformation, and the subband composition step

5   includes a step of compositing the frame data using two-dimensional inverse discrete wavelet transformation.

8.   The method according to claim 1, wherein the predetermined unit is a frame or a block obtained by

10   segmenting a frame into a plurality of blocks.

9.   A moving image decoding apparatus for decoding encoded moving image data, which is generated by decomposing each frame of moving image data into a

15   plurality of subbands, and encoding coefficients of the subbands from upper to lower bits for respective bitplanes or sub-bitplanes for each predetermined unit, comprising:

        decoding process time information acquisition

20   means for acquiring information used to examine a difference between a time assigned to a decoding process of encoded moving image data for the predetermined unit, and a time required for an actual decoding process;

25   non-decoding bitplane determination means for determining bitplanes or sub-bitplanes which are not to be decoded on the basis of the information acquired by

said decoding process time information acquisition
means;

bitplane decoding means for reclaiming the
coefficients of the subbands from encoded data of

5   bitplanes or sub-bitplanes other than the bitplanes or
sub-bitplanes determined by said non-decoding bitplane
determination means; and

subband composition means for generating frame
data by compositing the coefficients of the plurality

10   of subbands obtained by said bitplane decoding means.

10.   A program that can be executed by an information
processing apparatus, having a program code for
implementing a moving image decoding method of claim 1.

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11.   A storage medium that can be read by an
information processing apparatus, storing a program of
claim 10.

20   12.   An image decoding method of receiving moving
image data, in which images of respective frames have
been encoded, and decoding encoded image data of the
respective frames, comprising:

a sample frame decoding step of extracting

25   encoded image data of a sample frame from the
respective frames, and decoding the encoded image data
using a predetermined decoding unit;

a first measurement step of measuring a time required to decode the encoded image data of the sample frame;

a determination step of determining the number of
5   decoding units to be decoded so that the time measured in the first measurement step becomes not more than a predetermined time;

a decoding step of decoding encoded image data of the respective frames in accordance with the determined
10   number of decoding units;

a second measurement step of measuring a time required to decode each frame upon decoding the frame in the decoding step;

an update step of accumulating a difference
15   between the predetermined time and the time measured in the second measurement step every time the frame is decoded, and updating the number of decoding units determined in the determination step when the accumulated value becomes not less than a predetermined
20   value; and

in that the decoding step includes a step of decoding the encoded image data of each frame in accordance with the number of decoding units determined in the determination step or the number of decoding
25   units updated in the update step.

13.   The method according to claim 12, further

comprising:

        a third measurement step of measuring a time

required to decode each decoding unit upon decoding the

5   encoded image data of the sample frame in the sample

frame decoding step, and

        in that the determination step includes a step

of:

        determining, when the time measured in the first

10   measurement step is larger than the predetermined time,

the number of decoding units to be decoded by

subtracting the decoding time required to decode each

decoding unit measured in the third measurement step

from the time measured in the first measurement step,

15   and determining the number of non-decoding decoding

units, which is specified by arranging all decoding

units that form one frame in a predetermined order and

counting the arranged all decoding units, on the basis

of the number of times of subtraction of the time

20   measured in the third measurement step from the time

measured in the first measurement step, when the

difference becomes not more than the predetermined

value.

25   14.   The method according to claim 12, wherein the

determination step includes a step of determining

decoding units which are to be or not to be decoded of decoding units which form one frame.

15. The method according to claim 12, wherein the
5 update step includes a step of increasing, when the accumulated value becomes not less than a predetermined value, the number of decoding units determined in the determination step.

10 16. The method according to claim 12, further comprising a step of:

storing data of a table in which a plurality of different sets of values of a parameter associated with image quality and the numbers of decoding units to be
15 decoded are registered in a memory, and

in that the sample frame decoding step includes a step of executing the decoding process of the encoded image data of the sample frame using the parameter for different parameter values by changing the parameter
20 value,

the first measurement step includes a step of measuring decoding times in the sample frame decoding step for respective parameter values, and

the determination step includes a step of:
25 subtracting, when a first time measured in the first measurement step is larger than the predetermined time upon decoding the sample frame using a

predetermined parameter value in the sample frame

decoding step, a difference between neighboring times

from the first time in each decoding time, determining

the parameter value based on the number of times of

5   subtraction when the difference becomes not more than

the predetermined value, and determining the number of

decoding units to be decoded corresponding to the

determined parameter value with reference to the table.

10   17.   The method according to claim 16, wherein the

update step includes a step of increasing, when the

accumulated value becomes not less than the

predetermined value, the parameter value determined in

the determination step, and increasing the number of

15   decoding units with reference to the data of the table.

18.   The method according to claim 16, wherein the

parameter associated with image quality is a Q factor.

20   19.   The method according to claim 12, wherein the

decoding unit includes one of a bitplane and

sub-bitplane.

20.   The method according to claim 12, comprising a

25   step of holding images of respective frames decoded in

the decoding step for a predetermined number of frames,

and outputting the decoded images of the frames to a

display apparatus that makes display at a predetermined

frame rate at a predetermined time interval according

to the frame rate.

5   21.   An image decoding apparatus for receiving moving

image data, in which images of respective frames have

been encoded, and decoding encoded image data of the

respective frames, comprising:

sample frame decoding means for extracting

10   encoded image data of a sample frame from the

respective frames, and decoding the encoded image data

using a predetermined decoding unit;

first measurement means for measuring a time

required to decode the encoded image data of the sample

15   frame;

determination means for determining the number of

decoding units to be decoded so that the time measured

by said first measurement means becomes not more than a

predetermined time;

20   decoding means for decoding encoded image data of

the respective frames in accordance with the determined

number of decoding units;

second measurement means for measuring a time

required to decode each frame upon decoding the frame

25   by said decoding means; and

update means for accumulating a difference

between the predetermined time and the time measured by

said second measurement means every time the frame is

decoded, and updating the number of decoding units

determined by said determination means when the

accumulated value becomes not less than a predetermined

5   value, and

        in that said decoding means decodes the encoded

image data of each frame in accordance with the number

of decoding units determined by said determination

means or the number of decoding units updated by said

10   update means.

    22.   A program making a computer implement an image

decoding method of claim 12.

15   23.   A computer readable storage medium storing a

program of claim 22.